**Teaching Points for Buffers & Solutions Lab**

* Should have them work in PAIR or (maybe threes)
* Takes a LONG time – students should expect to break it up over 2 days. They can do Part 1 in advance and don’t necessarily need to do that with the same partner.
* Have them start by filling in Name, Date, Lab and Objective – before they begin lab
* They will hand write their wet lab notebooks (computer labs can be typed)
* Their lab notebooks are DUE at the end of the week so that we can grade them and give them quick turnaround on their first one.
* Make sure they use Dimensional Analysis in their notebooks to calculate amount of reagents to add
* They will do an Excel spreadsheet for the Avg and St.Dev. Then create a bar chart of the data with Error Bars as St. Deviation – be sure you remember/know how to do this….

Proper way to add Name, Date and Expt Name to the spreadsheet (date is ‘Ctrl+;’ in Excel and GDocs)

Proper way to Name and Save Files.

Have them save their spreadsheet to the ‘cloud’ – try UTWebspace first.

Must go to 1st time login page, then shutdown browser and re-login

Short Form of Standard Deviation



How the standard deviation should be written when expanded for their calculation by hand. They should write this out with the correct numbers filled in from their data and then solve it.



Some standard deviations use a 1/(N-1) instead of just N. You can ask the students if they think the 1/N vs. 1/(N-1) matters? They can look it up on at

<http://www.graphpad.com/faq/viewfaq.cfm?faq=1382>

**Important Skills:** sterile practices. No double dipping into a stock containter!, creating Excel graphs and using formulas in Excel, proper Lab Notebook writing, appropriate equipment to use for each step

**Important Concepts:** C1V1 = C2V2, Dimensional analysis, realization that EACH of these solutions will be used in future labs (not just for practice)

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